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ABSTRACT

The United States Training and Employment Service General Aptitude Test Battery (GATB), first published in 1947, has been included in a continuing program of research to validate the tests against success in many different occupations. The GATB consists of 12 tests which measure nine aptitudes: General Learning Ability; Verbal Aptitude; Numerical Aptitude; Spatial Aptitude; Form Perception; Clerical Perception; Motor Coordination; Finger Dexterity; and Manual Dexterity. The aptitude scores are standard scores with 100 as the average for the general working population, and a standard deviation of 20. Occupational norms are established in terms of minimum qualifying scores for each of the significant aptitude measures which, when combined, predict job performance. Cutting scores are set only for those aptitudes which aid in predicting the performance of the job duties of the experimental sample. The GATB norms described are appropriate only for jobs with content similar to that shown in the job description presented in this report. A description of the validation sample and a personnel evaluation form are also included. (AG)

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S-34R

June 1970

U.S. Training and
Employment Service
Technical Report
S-34R

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Development of USTES

APTITUDE TEST BATTERY FOR

BINDERY WORKER

(print. & pub.)
643.885

U.S. DEPARTMENT OF LABOR
Manpower Administration

TM 001 224

Technical Report on Development of USTES Aptitude Test Battery

For .....

BINDERY WORKER (print. & pub.) 643.885

S-34R

(Developed in Cooperation with the Ohio, Utah, Pennsylvania and North Carolina State Employment Services)

U.S. DEPARTMENT OF LABOR
Manpower Administration

June 1970

FOREWORD

The United States Training and Employment Service General Aptitude Test Battery (GATB) was first published in 1947. Since that time the GATB has been included in a continuing program of research to validate the tests against success in many different occupations. Because of its extensive research base the GATB has come to be recognized as the best validated multiple aptitude test battery in existence for use in vocational guidance.

The GATB consists of 12 tests which measure 9 aptitudes: General Learning Ability, Verbal Aptitude, Numerical Aptitude, Spatial Aptitude, Form Perception, Clerical Perception, Motor Coordination. Finger Dexterity, and Manual Dexterity. The aptitude scores are standard scores with 100 as the average for the general working population, with a standard deviation of 20.

Occupational norms are established in terms of minimum qualifying scores for each of the significant aptitude measures which, in combination predict job performance. For any given occupation, cutting scores are set only for those aptitudes which contribute to the prediction of performance of the job duties of the experimental sample. It is important to recognize that another job might have the same job title but the job content might not be similar. The GATB norms described in this report are appropriate for use only for jobs with content similar to that shown in the job description included in this report.

GATB Study #2680

Development of USTES Aptitude Test Battery

For

Bindery Worker (print. & pub.) 643.885-010

S-34R

This report describes research undertaken for the purpose of developing General Aptitude Test Battery (GATB) norms for the occupation of Bindery Worker (print. & pub.) 643.885-010. The following norms were established:

GATB Aptitudes	Minimum Acceptable GATB Scores
S - Spatial Perception	70
Q - Clerical Perception	80
K - Motor Coordination	95
F - Finger Dexterity	75

RESEARCH SUMMARY

Sample:

75 female and 28 male workers employed as Bindery Workers in Ohio, Utah, Pennsylvania, and North Carolina.

This study was conducted prior to the requirement of providing minority group information. Therefore, minority group status is unknown.

Criterion:

Supervisory ratings using a descriptive rating scale.

Design:

Concurrent validation (test and criterion data were collected at approximately the same time except for the 15 workers in the Utah sample).

Minimum aptitude requirements were determined on the basis of a job analysis and statistical analyses of aptitude mean scores, standard deviations, aptitude-criterion correlations, and selective efficiencies.

Concurrent Validity:

Phi Coefficient = .37 ($P/2 < .0005$)

Effectiveness of Norms:

Only 66% of the nontest-selected workers used for this study were good workers; if the workers had been test-selected with the above norms, 79% would have been good workers. Thirty-four percent of the nontest-selected workers used for this study were poor workers; if the workers

had been test-selected with the above norms, only 21% would have been poor workers. The effectiveness of the norms is shown graphically in Table 1:

TABLE 1

Effectiveness of Norms

	Without Tests	With Tests
Good Workers	66%	79%
Poor Workers	34%	21%

SAMPLE DESCRIPTION

Size:

N = 103 (28 males and 75 females)

Occupational Status:

Employed workers performing general hand and machinery bindery worker duties (cutting-machine operators, specialists, and supervisors were excluded)

No workers over 54 years of age were included. This cut-off point was reached on two bases: the GATB was standardized on ages 18 - 54, and employers tend not to hire inexperienced workers at the upper age levels.

Work Setting:

Workers were employed by the following:

N	Company	City	State
11	Otterbein Press-Printing Service	Dayton	Ohio
17	Delmar	Matthews	North Carolina
14	Kale Ruling & Binding Co.	Charlotte	North Carolina
14	Butterick Company	Altoona	Pennsylvania
6	Colonial Press	Pittsburgh	Pennsylvania
3	Grit Publishing Co.	Williamsport	Pennsylvania
2	Herbeck & Held	Pittsburgh	Pennsylvania
6	William G. Johnston Co.	Pittsburgh	Pennsylvania
11	Leigh Lithographing Co.	Bethlehem	Pennsylvania
4	Mennonite Publishing House	Scottsdale	Pennsylvania
9	Hiller Bookbinding Co.	Salt Lake City	Utah
4	Mountain States Bindery	Salt Lake City	Utah
2	Utah Bookbinding Co., Inc.	Salt Lake City	Utah

Employer Selection Requirements:

Education:

Open. Most employers want new bindery workers to have some high school education. Some employers insist on a high school diploma or related work experience.

Previous Experience:

Most employers prefer to hire experienced employees. Since available trained employees do not exist in sufficient numbers to meet worker demand, most employers provide on-job training for new inexperienced workers.

Tests:

Only two firms in the experimental sample administered tests. The tests used are the Wonderlic Personnel Test, Minnesota Paper Board Form, Psychological Corp. Test of Manual Dexterity, and Color Discrimination Tests.

Other:

A personal interview by the personnel department and/or the immediate supervisor is universal. Minimum age is generally 18, though temporary summer workers are employed at age 16. (These young, temporary workers are not permitted to work with machinery.) Maximum age for inexperienced workers is generally 30 - 35, and for experienced workers 40 - 45, although occasionally an outstanding older worker is hired.

Principal Activities:

The job duties of all workers are comparable to those shown in the job description in the Appendix.

Minimum Experience:

All workers in this sample had a minimum of 4 months experience.

TABLE 2

Means, Standard Deviations (SD), Ranges and Pearson Product-Moment Correlations with the Criterion (r) for Age, Education and Experience

	Mean	SD	Range	r
Age (years)	36.1	9.7	21-53	-.173
Education (years)	11.0	1.6	6-14	.125
Experience (months)	84.5	64.8	4-359	.131

EXPERIMENTAL TEST BATTERY

All 12 tests of the GATB, B-1002 were administered between January 8, 1964, to February 10, 1966. Three different answer sheets were used: 42 NCS-B, 57 IBM-B, and 4 IBM-A.

CRITERION

The criterion data consisted of supervisory ratings of job proficiency made at approximately the same time as the test data were collected, except for the Utah sample. The Utah sample of trained workers was tested in January and February, 1964, but rated in June and July, 1967. Immediate supervisors made two ratings on all but 19 workers with a time interval of about two weeks between ratings. Each worker's criterion score was the sum of the two ratings. Single ratings were doubled to make them equivalent.

Rating Scale:

A "Descriptive Rating Scale," patterned after USES Form SP-21, was used for rating all but 17 workers from the Delmar Plant, Matthews, N. C. These 17 workers were rated with USES Form SP-21 (see Appendix). The modified SP-21 scale used for this study consists of seven items covering different aspects of job performance. Each item has five alternatives corresponding to different degrees of job proficiency. (The 17 SP-21 ratings were rescored for only the common items, making rating scale content comparable.)

Reliability:

The correlation between the two ratings is .834 indicating a significant relationship. Therefore, the final criterion consisted of the combined scores of the two sets of ratings.

An N of 70 was used in computing the reliability coefficient. One rating only was obtained for 19 workers. Identical "item by item" first and second ratings were given another 14 workers. Such "perfect" ratings seemed suspect. Consequently, 33 ratings were eliminated when determining rating scale reliability.

Criterion Score Distribution:

Possible Range:	14-70
Actual Range:	35-70
Mean:	52.4
Standard Deviation:	7.9

Criterion Dichotomy:

All 103 criterion scores were used to establish the criterion dichotomy. Since this sample consisted of experienced workers who had demonstrated satisfactory performance and there was no clear-cut point of demarcation between satisfactory and unsatisfactory workers, the division point was set so that as close as possible to one-third of the sample was placed in the low criterion group. The criterion distribution was dichotomized into high and low groups by placing 34% of the sample in the low criterion group to correspond with the percentage of workers considered unsatisfactory or marginal. Workers in the high criterion group were designated as "good workers," and those in the low group as "poor workers." The criterion critical score is 49.

APTITUDES CONSIDERED FOR INCLUSION IN THE NORMS

Aptitudes were considered for inclusion in the norms on the basis of a qualitative analysis of job duties and a statistical analysis of test and criterion data. On the basis of qualitative and quantitative data, Aptitudes G, S, Q, K, F, and M were considered for inclusion in the norms.

Aptitudes G, S, and F have a significant correlation with the criterion. Aptitude Q has a relatively high mean and a relatively low standard deviation. Aptitude K appears to be important on the basis of job analysis, and has a relatively low mean and a relatively low standard deviation. Aptitude M appears to be important on the basis of job analysis and has a relatively high mean.

In a concurrent validation study, a relatively low standard deviation may indicate some sample pre-selection, and this restricted range of scores (low standard deviation) will depress the correlation between the aptitude and the criterion. A relatively high mean score in a concurrent validation study may also indicate some sample pre-selection. Tables 3, 4, and 5 show the results of the qualitative and statistical analyses.

TABLE 3

Qualitative Analysis
(Based on the job analysis, the aptitudes indicated appear to be important to the work performed.)

Aptitude	Rationale
P - Form Perception	Important to align signatures, round backs, and adjust guides for size and shape of pages and covers, and perceive other details of binding.
K - Motor Coordination	Important for rhythmic or speed timing to sort, cut, feed, and stamp book materials, and adjust and activate machinery.
F - Finger Dexterity	Important to perform various manipulative functions from the more gross movements of machine operation to the finer movements of paper handling, machine set up, and adjusting.
M - Manual Dexterity	Important in performing hand and machine operations to fold, gather, staple, sew, trim, and glue book materials.

TABLE 4

Means, Standard Deviations (SD), Ranges, and Pearson Product-Moment Correlations with the Criterion (r) for the Aptitudes of the GATB

Aptitude	Mean	SD	Range	r
G - General Learning Ability	90.2	15.7	60-129	.202*
V - Verbal Aptitude	91.4	13.7	68-135	.136
N - Numerical Aptitude	89.6	15.8	52-122	.136
S - Spatial Aptitude	96.0	17.5	58-140	.222*
P - Form Perception	98.2	18.6	60-140	.165
Q - Clerical Perception	101.7	14.7	68-141	.000
K - Motor Coordination	105.3	14.3	58-144	.046
F - Finger Dexterity	99.6	19.0	27-143	.414**
M - Manual Dexterity	107.5	20.1	46-149	.143

*Significant at the .05 level
**Significant at the .01 level

TABLE 5

Summary of Qualitative and Quantitative Data

Type of Evidence	Aptitudes								
	G	V	N	S	P	Q	K	F	M
Job Analysis Data									
Important					X		X	X	X
Irrelevant		O							
Relatively High Mean						X	X		X
Relatively Low Standard Deviation		X				X	X		
Significant Correlation with Criterion	X			X				X	
Aptitudes to be Considered for Trial Norms	G			S		Q	K	F	M

DERIVATION AND VALIDITY OF NORMS

Final norms were derived on the basis of a comparison of the degree to which trial norms consisting of various combinations of aptitudes G, S, Q, K, F, and M at trial cutting scores were able to differentiate between the 66% of the sample considered good workers and 34% of the sample considered poor workers. Trial cutting scores at five point intervals approximately one standard deviation below the mean were tried because this will eliminate about one-third of the sample with three-aptitude norms. For two-aptitude trial norms, minimum cutting scores of slightly higher than one standard deviation below the mean will eliminate about one-third of the sample; for four-aptitude trial norms, cutting scores of slightly lower than one standard deviation below the mean will eliminate about one-third of the sample. The phi coefficient was used as a basis for comparing trial norms. Norms of S-70, Q-80, K-95, and F-75 provided the optimum differentiation. The validity of these norms is shown in Table 6 and is indicated by a phi coefficient of .37 (statistically significant at the .0005 level).

TABLE 6

Concurrent Validity of Test Norms S-70, Q-80, K-95, and F-75

	Nonqualifying Test Scores	Qualifying Test Scores	Total
Good Workers	14	54	68
Poor Workers	21	14	35
Total	35	68	103

Phi coefficient (ϕ) = .37 Chi square (X^2_y) = 14.3
Significance level = $P/2 < .0005$

DETERMINATION OF OCCUPATIONAL APTITUDE PATTERN

The data for this study met the requirements for incorporating the occupation studied into OAP-45 which is shown in the 1970 edition of Section II of Manual for the General Aptitude Test Battery. A Phi Coefficient of .17 is obtained with the OAP-45 norms of S-80, Q-90, F-80.

A P P E N D I X

Basis for Selecting Final Norms

Descriptive Rating Scale

Fact Sheet

INFORMATION TO BE PROVIDED BY RATER

RATINGS FOR _____
Company Job Title

RATED BY _____ TITLE _____

COMPANY _____

LOCATION _____ DATE _____
(City) (State)

First Rating ☐

Second Rating ☐

NAME

	A	B	C	D	E
	A	B	C	D	E
	A	B	C	D	E
	A	B	C	D	E
	A	B	C	D	E
	A	B	C	D	E
	A	B	C	D	E
	A	B	C	D	E
	A	B	C	D	E
	A	B	C	D	E
	A	B	C	D	E
	A	B	C	D	E
	A	B	C	D	E
	A	B	C	D	E
	A	B	C	D	E
	A	B	C	D	E
	A	B	C	D	E
	A	B	C	D	E
	A	B	C	D	E
	A	B	C	D	E
	A	B	C	D	E
	A	B	C	D	E

How often do you see this worker in a work situation?

A **See him at work all the time.**

B **See him at work several times a day.**

C **See him at work several times a week.**

D **Seldom see him in work situation.**

E

FORMAT:

A modified, general SP-21 (rev. 2/61) Descriptive Rating Scale was used in this study. This modification was made to encourage raters to rate all workers on one item before going to the next and to reduce the number of rating forms needed.

This new design casts the rating scale into booklet form. The booklet contains an extended flap for entering names of examinees and matching half sheets for rating scale items.

PROCEDURE:

Examinees' names are listed on the extended flap of the form. The center portion (with columns of A's, B's, C's, D's, and E's) provides the rating space, and the right-hand portion presents the rating item.

After all examinees have been rated on an item, the right-hand portion is folded over, exposing a new item and new columns of A's, B's, C's, D's, and E's.

The form folds at the point indicated by the dotted line.

A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E

How long have you worked with him?

A Under one month.

B One to two months.

C Three to five months.

D Six months or more.

E

A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E

How much work can he get done? (Worker's <u>ability</u> to make efficient use of his time and to work at high speed.)

A — Capable of very low work output. Can perform only at an unsatisfactory pace.

B — Capable of low work output. Can perform at a slow pace.

C — Capable of fair work output. Can perform at an acceptable but not a fast pace.

D — Capable of high work output. Can perform at a fast pace.

E — Capable of very high work output. Can perform at an unusually fast pace.

A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
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A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E

How good is the quality of his work? (Worker's ability to do high-grade work which meets quality standards.)

A — Very poor. Does work of unsatisfactory grade. Performance is inferior and almost never meets minimum quality standards.

B — Not too bad, but the grade of his work could stand improvement. Performance is usually acceptable but somewhat inferior in quality.

C — Fair. The grade of his work is mediocre. Performance is acceptable but usually not superior in quality.

D — Good, but the grade of his work is not outstanding. Performance is usually superior in quality.

E — Very good. Does work of outstanding grade. Performance is almost always of the highest quality.

A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
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A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E

How accurate is he in his work? (Worker's ability to avoid making mistakes.)

A — Very inaccurate. Makes very many mistakes. Work needs constant checking.

B — Inaccurate. Makes frequent mistakes. Work needs more checking than is desirable.

C — Fairly accurate. Makes mistakes occasionally. Work needs only normal checking.

D — Accurate. Makes few mistakes. Work seldom needs checking.

E — Highly accurate. Rarely makes a mistake. Work almost never needs checking.

A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E

How much does he know about his job? (Worker's understanding of the principles, equipment, materials and methods that have to do directly or indirectly with his work.)

A — Has very limited knowledge. Does not know enough to do his job adequately.

B — Has little knowledge. Knows enough to "get by."

C — Has moderate amount of knowledge. Knows enough to do fair work.

D — Has broad knowledge. Knows enough to do good work.

E — Has complete knowledge. Knows his job thoroughly.

A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
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A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E

How much aptitude or facility does he have for this kind of work? (Worker's adeptness or knack for performing his job easily and well.)

A — Very low aptitude. Has great difficulty doing his job. Not at all suited to this kind of work.

B — Low aptitude. Usually has some difficulty doing his job. Not too well suited to this kind of work.

C — Moderate aptitude. Does his job without too much difficulty. Fairly well suited to this kind of work.

D — High aptitude. Usually does his job without difficulty. Well suited to this kind of work.

E — Very high aptitude. Does his job with great ease. Unusually well suited for this kind of work.

A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
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A	B	C	D	E
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A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E

How large a variety of job duties can he perform efficiently? (Worker's ability to handle several different operations in his work.)

A A very limited variety. Cannot perform different operations adequately.

B A small variety. Can perform few different operations efficiently.

C A moderate variety. Can perform some different operations with reasonable efficiency.

D A large variety. Can perform several different operations efficiently.

E An unusually large variety. Can do very many different operations efficiently.

A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
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A	B	C	D	E
A	B	C	D	E
A	B	C	D	E
A	B	C	D	E

Considering all the factors already rated, and only these factors, how satisfactory is his work? (Worker's "all-around" ability to do his job.)

A — Definitely unsatisfactory. Would be better off without him. Performance usually not acceptable.

B — Not completely satisfactory. Of limited value to the organization. Performance somewhat inferior.

C — Satisfactory. A fairly proficient worker. Performance generally acceptable.

D — Good. A valuable worker. Performance usually superior.

E — Outstanding. An unusually competent worker. Performance almost always top notch.

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FACT SHEET

Job Title:

Bindery Worker (print. and pub.) 643.885-010

Job Summary:

Performs a variety of operations required to assemble printed materials and bind them in either hard or soft covers. Works with either new or used publications such as books, periodicals, manuals, and magazines. Operations entail such functions as folding, gathering, stapling, sewing, tipping, rounding and backing, gluing, trimming, casing-in, and embossing. Feeds, removes, and stacks materials as necessary. Utilizes automatic binding equipment to perform most operations. Duties are performed as task assignments and not as the collection of duties performed by Bookbinder, Hand.

Work Performed:

Performs a variety of binding operations: Performs a variety of duties like the following: Folds and cuts printed sheets into signatures. Gathers signatures sequentially. Stitches or staples them together to form book bodies. Glues head bands and paper lining to the developing book. Rounds the back of unbound books into convex shape and forms grooves on which to hinge the cover. Cuts the cardboard and book cover stock. Measures, cuts, and fits the book backbone. Feeds the presized cover through a continuous gluing process, fixing the cover edges and side sections to the glued cover. Permanently seals the cover edges to the cardboard sections. Glues end sheets to the cover. Stamps letters, figures, and designs on book covers. May add dust covers to completed books. Feeds, removes, and stacks materials as necessary.

Utilizes automatic binding equipment to perform most above binding operations: Feeds and tends binding machines which perform single, multiple, or continuous workflow functions. May be assigned to operate one or more of these or similar type machines which perform the functions indicated.

Folding Machine: Automatically folds and splits printed sheets into signatures.

Gathering Machine: Gathers together signatures and forms book bodies for binding.

Stapling Machine: Staples sequentially placed signatures to secure a publication.

Sewing Machine: Sews through folded center of each signature fastening one signature to another.

Tipping Machine: Tips end sheets or photographs to signatures with a thin strip of adhesive.

Case-Making Machine: Wraps fabric cover around boards to form hard-back covers.

Head-Bander and Liner Machine: Glues head bands and paper lining to back of signatures prior to casing-in.

Automatic Casing-In Machine: Glues end sheets, positions case, and presses and seals backbone and end sheets to case.

Embossing Machine: Embosses colored and uncolored letters, figures, and designs on book covers.

Sealomatic Machine: Fuses layers of thermoplastic to form plastic covers.

GBC Punching and Binding Machines: Punches rectangular holes and inserts plastic strips into holes to hold publication together.

Wire-O Punching, Binding, and Closing Machines: Punches holes, inserts and bends wire in pre-established pattern through the punched holes, and clinches wire around back edge of publication.

May perform bindery duties by hand when binding requirements are not adaptable to machine operations.

Effectiveness of Norms:

Only 66% of the nontest-selected workers used for this study were good workers; if the workers had been test-selected with the S-34R norms, 79% would have been good workers. Thirty-four percent of the nontest-selected workers used for this study were poor workers; if the workers had been test-selected with the S-34R norms, only 21% would have been poor workers.

Applicability of S-34R Norms:

The aptitude test battery is applicable to jobs which include a majority of duties described above.

GPO 898-802